



General

Guideline Title

Clinical guideline: management of gastroparesis.

Bibliographic Source(s)

Camilleri M, Parkman HP, Shafi MA, Abell TL, Gerson L. Clinical guideline: management of gastroparesis. Am J Gastroenterol. 2013 Jan;108(1):18-37; quiz 38. [177 references] [PubMed](#)

Guideline Status

This is the current release of the guideline.

Recommendations

Major Recommendations

Definitions of the quality of evidence (High, Moderate, Low, Very low) and strength of recommendations (Strong and Conditional) are provided at the end of the "Major Recommendations" field.

Definition of Gastroparesis Syndrome and Gastroparesis Symptoms

1. The diagnosis of gastroparesis is based on the combination of symptoms of gastroparesis, absence of gastric outlet obstruction or ulceration, and delay in gastric emptying. (Strong recommendation, high level of evidence)
2. Accelerated gastric emptying and functional dyspepsia can present with symptoms similar to those of gastroparesis; therefore, documentation of delayed gastric emptying is recommended before selecting therapy with prokinetics agents or gastric electrical stimulation (GES). (Strong recommendation, moderate level of evidence)

Identifying the Cause of Gastroparesis

1. Patients with gastroparesis should be screened for the presence of diabetes mellitus, thyroid dysfunction, neurological disease, prior gastric or bariatric surgery, and autoimmune disorders. Patients should undergo biochemical screen for diabetes and hypothyroidism; other tests are as indicated clinically. (Strong recommendation, high level of evidence)
2. A prodrome suggesting a viral illness may lead to gastroparesis (postviral gastroparesis). This condition may improve over time in some patients. Clinicians should inquire about the presence of a prior acute illness suggestive of a viral infection. (Conditional recommendation, low level of evidence)
3. Markedly uncontrolled (>200 mg/dl) glucose levels may aggravate symptoms of gastroparesis and delay gastric emptying. (Strong recommendation, high level of evidence) Optimization of glycemic control should be a target for therapy; this may improve symptoms and

the delayed gastric emptying. (Moderate recommendation, moderate level of evidence)

4. Medication-induced delay in gastric emptying, particularly from narcotic and anticholinergic agents and glucagon like peptide-1 (GLP-1) and amylin analogs among diabetics, should be considered in patients before assigning an etiological diagnosis. Narcotics and other medications that can delay gastric emptying should be stopped to establish the diagnosis with a gastric emptying test. (Strong recommendation, high level of evidence)
5. Gastroparesis can be associated with and may aggravate gastroesophageal reflux disease (GERD). Evaluation for the presence of gastroparesis should be considered in patients with GERD that is refractory to acid-suppressive treatment. (Conditional recommendation, moderate level of evidence)

Diagnosis of Gastroparesis

1. Documented delay in gastric emptying is required for the diagnosis of gastroparesis. Scintigraphic gastric emptying of solids is the standard for the evaluation of gastric emptying and the diagnosis of gastroparesis. The most reliable method and parameter for diagnosis of gastroparesis is gastric retention of solids at 4 hours (h) measured by scintigraphy. Studies of shorter duration or based on a liquid challenge result in decreased sensitivity in the diagnosis of gastroparesis. (Strong recommendation, high level of evidence)
2. Alternative approaches for assessment of gastric emptying include wireless capsule motility testing and ¹³C breath testing using octanoate or spirulina incorporated into a solid meal; they require further validation before they can be considered as alternates to scintigraphy for the diagnosis of gastroparesis. (Conditional recommendation, moderate level of evidence)
3. Medications that affect gastric emptying should be stopped at least 48 h before diagnostic testing; depending on the pharmacokinetics of the medication, the drug may need to be stopped >48 h before testing. (Strong recommendation, high level of evidence)
4. Patients with diabetes should have blood glucose measured before starting the gastric emptying test, and hyperglycemia treated with test started after blood glucose is <275 mg/dl. (Strong recommendation, moderate-high level of evidence)

Exclusion Criteria and Differential Diagnosis

1. The presence of rumination syndrome and/or eating disorders (including anorexia nervosa and bulimia) should be considered when evaluating a patient for gastroparesis. These disorders may be associated with delayed gastric emptying, and identification of these disorders may alter management. (Strong recommendation, moderate-high level of evidence)
2. Cyclic vomiting syndrome (CVS) defined as recurrent episodic episodes of nausea and vomiting, should also be considered during the patient history. These patients may require alternative therapy. (Conditional recommendation, moderate level of evidence)
3. Chronic usage of cannabinoid agents may cause a syndrome similar to CVS. Patients presenting with symptoms of gastroparesis should be advised to stop using these agents. (Conditional recommendation, low level of evidence)

Management of Gastroparesis

1. The first line of management for gastroparesis patients should include restoration of fluids and electrolytes, nutritional support and in diabetics, optimization of glycemic control. (Strong recommendation, moderate level of evidence)
2. Oral intake is preferable for nutrition and hydration. Patients should receive counseling from a dietician regarding consumption of frequent small volume nutrient meals that are low in fat and soluble fiber. If unable to tolerate solid food, then use of homogenized or liquid nutrient meals is recommended. (Conditional recommendation, low level of evidence)
3. Oral intake is the preferable route for nutrition and hydration. If oral intake is insufficient, then enteral alimentation by jejunostomy tube feeding should be pursued (after a trial of nasogastric tube feeding). Indications for enteral nutrition include unintentional loss of 10% or more of the usual body weight during a period of 3–6 months, and/or repeated hospitalizations for refractory symptoms. (Strong recommendation, moderate level of evidence)
4. For enteral alimentation, postpyloric feeding is preferable to gastric feeding because gastric delivery can be associated with erratic nutritional support. (Conditional recommendation, low level of evidence)
5. Enteral feeding is preferable to parenteral nutrition. (Conditional recommendation, low level of evidence)

Glycemic Control in Diabetic Gastroparesis (DG)

1. Good glycemic control should be the goal. Since acute hyperglycemia inhibits gastric emptying, it is assumed that improved glycemic control may improve gastric emptying and reduce symptoms. (Conditional recommendation, moderate level of evidence)
2. Pramlintide and GLP-1 analogs may delay gastric emptying in diabetics. Cessation of these treatments and use of alternative approaches should be considered before initiation of therapy for gastroparesis. (Conditional recommendation, low level of evidence)

Pharmacologic Therapy

1. In addition to dietary therapy, prokinetic therapy should be considered to improve gastric emptying and gastroparesis symptoms, taking into account benefits and risks of treatment. (Strong recommendation, moderate level of evidence)
2. Metoclopramide is the first line of prokinetic therapy and should be administered at the lowest effective dose in a liquid formation to facilitate absorption. The risk of tardive dyskinesia has been estimated to be <1%. Patients should be instructed to discontinue therapy if they develop side effects including involuntary movements. (Strong recommendation, moderate level of evidence)
3. For patients unable to use metoclopramide, domperidone can be prescribed with investigational new drug clearance from the Food and Drug Administration (FDA) and has been shown to be as effective as metoclopramide in reducing symptoms without the propensity for causing central nervous system side effects; given the propensity of domperidone to prolong corrected QT interval on electrocardiogram, a baseline electrocardiogram is recommended and treatment withheld if the corrected QT is >470 ms in male and 450 ms in female patients. Follow-up electrocardiogram on treatment with domperidone is also advised. (Strong recommendation, moderate level of evidence)
4. Erythromycin improves gastric emptying and symptoms from delayed gastric emptying. Administration of intravenous (IV) erythromycin should be considered when IV prokinetic therapy is needed in hospitalized patients. Oral treatment with erythromycin improves gastric emptying also. However, the long-term effectiveness of oral therapy is limited by tachyphylaxis. (Strong recommendation, moderate level of evidence)
5. Treatment with antiemetic agents should occur for improvement of associated nausea and vomiting but will not result in improved gastric emptying. (Conditional recommendation, moderate level of evidence)
6. Tricyclic antidepressants (TCA) can be considered for refractory nausea and vomiting in gastroparesis but will not result in improved gastric emptying and may potentially retard gastric emptying. (Conditional recommendation, low level of evidence)

Intr pyloric Botulinum Toxin Injection

Intr pyloric injection of botulinum toxin is not recommended for patients with gastroparesis based on randomized controlled trials. (Strong recommendation, high level of evidence)

Gastric Electrical Stimulation (GES)

GES may be considered for compassionate treatment in patients with refractory symptoms, particularly nausea and vomiting. Symptom severity and gastric emptying have been shown to improve in patients with diabetic gastroparesis (DG), but not in patients with idiopathic gastroparesis (IG) or postsurgical gastroparesis (PSG). (Conditional recommendation, moderate level of evidence)

Surgical Treatments: Venting Gastrostomy, Gastrojejunostomy, Pyloroplasty, and Gastrectomy

1. Gastrostomy for venting and/or jejunostomy for feeding may be performed for symptom relief. (Conditional recommendation, low level of evidence)
2. Completion gastrectomy could be considered in patients with PSG who remain markedly symptomatic and fail medical therapy. (Conditional recommendation, low level of evidence)
3. Surgical pyloroplasty or gastrojejunostomy has been performed for treatment for refractory gastroparesis. However, further studies are needed before advocating this treatment. Partial gastrectomy and pyloroplasty should be used rarely, only in carefully selected patients. (Conditional recommendation, low level of evidence)

Complementary and Alternative Therapies

Acupuncture can be considered as an alternative therapy. This has been associated with improved rates of gastric emptying and reduction of symptoms. (Conditional recommendation, low level of evidence)

Definitions:

Quality of Evidence - Definitions and Determinants

Grade	Definition
High	Further research is unlikely to change the authors' confidence in the estimate of effect
Moderate	Further research is likely to have an important impact on the authors' confidence in the estimate of effect and may change the estimate
Low	Further research is very likely to have an important impact on the authors' confidence in the estimate of effect and is likely to change the estimate

Very Grade Low	Any estimate of effect is very uncertain
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Strength of Recommendation Using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) System

The strength of a recommendation was graded as "strong" when the desirable effects of an intervention clearly outweigh the undesirable effects and as "conditional" when there is uncertainty about the trade-offs.

Clinical Algorithm(s)

The original guideline document contains clinical algorithms for:

- Stepwise diagnosis and management of gastroparesis
- Treatment of gastroparesis
- Prokinetic therapy in gastroparesis

Scope

Disease/Condition(s)

Gastroparesis

Guideline Category

Diagnosis

Evaluation

Management

Treatment

Clinical Specialty

Endocrinology

Family Practice

Gastroenterology

Internal Medicine

Surgery

Intended Users

Advanced Practice Nurses

Health Care Providers

Nurses

Physician Assistants

Physicians

Guideline Objective(s)

To provide recommendations for the evaluation and management of patients with gastroparesis

Target Population

Individuals with gastroparesis

Interventions and Practices Considered

Assessment/Diagnosis

1. Screening for diabetes mellitus, thyroid dysfunction, neurological disease, prior gastric or bariatric surgery, autoimmune disorders, diabetes and hypothyroidism
2. Patient history (including the presence of a prior acute illness suggestive of a viral infection or cyclic vomiting syndrome [CVS])
3. Consideration of medication-induced delay in gastric emptying, (particularly from narcotic and anticholinergic agents, glucagon like peptide-1 [GLP-1] and amylin analogs among diabetics)
4. Evaluation for gastroparesis in patients with gastroesophageal reflux disease (GERD) that is refractory to acid-suppressive treatment
5. Scintigraphic gastric emptying of solids (gastric retention of solids at 4 hours measured by scintigraphy)
6. Alternative approaches for assessment of gastric emptying include wireless capsule motility testing and C breath testing using octanoate or spirulina incorporated into a solid meal.
7. Exclusion criteria and differential diagnosis (presence of rumination syndrome and/or eating disorders including anorexia nervosa and bulimia, cyclic vomiting syndrome, chronic usage of cannabinoid agents)

Management/Treatment

1. Restoration of fluids and electrolytes
2. Nutritional support
3. Optimization of glycemic control in diabetic patients
4. Counseling from a dietician (consumption of frequent small volume nutrient meals that are low in fat and soluble fiber)
5. Homogenized or liquid nutrient meals as indicated
6. Postpyloric feeding
7. Enteral feeding
8. Pharmacological therapy
 - Metoclopramide, domperidone, erythromycin
 - Antiemetic agents
 - Tricyclic antidepressants (TCA)
9. Gastric electrical stimulation (GES)
10. Surgical treatment
 - Gastrostomy for venting and/or jejunostomy for feeding
 - Completion gastrectomy
 - Partial gastrectomy and pyloroplasty (in select patients)
11. Complementary/alternative therapy (acupuncture)
12. Intrapyloric injection of botulinum toxin was considered but not recommended
13. Acupuncture (as an alternative therapy)

Major Outcomes Considered

- Symptom improvement
- Glycemic control
- Improvement in gastric emptying
- Quality of Life
- Adverse effects of treatment

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

A search of OVID Medline, PubMed, and ISI Web of Science was conducted for the years from 1960 to 2011 using the following major search terms and subheadings including "gastroparesis," "electrical stimulation," "botulinum toxin," "drug therapy," "glycemic control," "dietary therapy," and "alternative therapy". The authors used systematic reviews and meta-analyses for each topic when available, followed by a review of clinical trials.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Quality of Evidence - Definitions and Determinants

Grade	Definition
High	Further research is unlikely to change the authors' confidence in the estimate of effect
Moderate	Further research is likely to have an important impact on the authors' confidence in the estimate of effect and may change the estimate
Low	Further research is very likely to have an important impact on the authors' confidence in the estimate of effect and is likely to change the estimate
Very Low	Any estimate of effect is very uncertain

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

The Grading System of Recommendations Assessment, Development, and Evaluation (GRADE) system was used to evaluate the overall quality of evidence.

The quality of evidence could range from "high" (implying that further research was unlikely to change the authors' confidence in the estimate of the effect) to "moderate" (further research would be likely to have an impact on the confidence in the estimate of effect) or "low" (further research would be expected to have an important impact on the confidence in the estimate of the effect and would be likely to change the estimate).

Methods Used to Formulate the Recommendations

Expert Consensus (Nominal Group Technique)

Description of Methods Used to Formulate the Recommendations

Each recommendation is generated by a process known as the "nominal group technique." In this process, the authorship group first discusses the goal of the recommendation. Then each member of the group writes one or more statements that they feel best expresses the goal of the recommendation. These statements are disseminated, without attribution of author, among the authors, who then rank the statements, first, second, third, and so on. The statement with the lowest point total is deemed to best express the consensus of the group, and is endorsed.

Rating Scheme for the Strength of the Recommendations

The Grading of Recommendations Assessment, Development, and Evaluation (GRADE) system was used to grade the strength of recommendations.

The strength of a recommendation was graded as "strong" when the desirable effects of an intervention clearly outweigh the undesirable effects and as "conditional" when there is uncertainty about the trade-offs.

Cost Analysis

A formal cost analysis was not performed and cost analyses were not reviewed.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

In an effort to make new guidelines as "fresh" as possible when published, the American College of Gastroenterology (ACG) created a special guideline review process, involving members of the Board of Trustees, Practice Parameters Committee, the American Journal of Gastroenterology and Extramural Reviewers. It is the goal to review the guideline, allow guideline authors to revise the guideline, and re-review the guideline within 6 months of first submission. Therefore the entire process should take 1 year from commission to finished, accepted guideline.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate management of patients with gastroparesis to improve outcomes

Potential Harms

- The FDA placed a black-box warning on metoclopramide because of the risk of side effects, including tardive dyskinesia.
- Complications of enteral nutrition include infection, tube migration, and dislodgement.
- With enteral nutrition, there is a theoretical risk of increased pulmonary aspiration in patients with weak lower esophageal sphincter; hence, it is advisable that the feeding tube should be placed well beyond the angle of Treitz in such patients.
- Complications from gastric electrical stimulation (GES) such as local infection or lead migration, as well as complications related to the surgery may occur in up to 10% of patients implanted.
- The risk of malnutrition and weight loss following gastrectomy has to be weighed relative to the symptom relief.
- Metoclopramide is the first line of prokinetic therapy and should be administered at the lowest effective dose. The risk of tardive dyskinesia has been estimated to be < 1%. Patients should be instructed to discontinue therapy if they develop side effects including involuntary movements.
- Several US medical centers have recently placed several additional restrictions on promethazine, related to concerns about sedation, possible cardiac toxicity (corrected QT prolongation), damage to peripheral veins, and lack of availability of the drug.
- The synthetic cannabinoid, dronabinol, carries the risk of hyperemesis on withdrawal, and optimum treatment strategies are unclear.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Clinical Algorithm

Patient Resources

Resources

Staff Training/Competency Material

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Living with Illness

IOM Domain

Effectiveness

Identifying Information and Availability

Bibliographic Source(s)

Camilleri M, Parkman HP, Shafi MA, Abell TL, Gerson L. Clinical guideline: management of gastroparesis. Am J Gastroenterol. 2013 Jan;108(1):18-37; quiz 38. [177 references] [PubMed](#)

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2013 Jan

Guideline Developer(s)

American College of Gastroenterology - Medical Specialty Society

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Guideline Committee

Not stated

Composition of Group That Authored the Guideline

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Financial Disclosures/Conflicts of Interest

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Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available from the [American College of Gastroenterology \(ACG\) Web site](#) .

Availability of Companion Documents

The following are available:

- Gastroparesis: continuing medical education questions. Available in Portable Document Format (PDF) from the [American Journal of Gastroenterology Web site](#) .
- American College of Gastroenterology Practice Parameters Committee. Guideline development policies. 2010 Jan. Available from the [American College of Gastroenterology \(ACG\) Web site](#) .

Patient Resources

The following is available:

- Gastroparesis. Podcast. Available from the [American College of Gastroenterology \(ACG\) Web site](#) .

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC Status

This NGC summary was completed by ECRI Institute on March 28, 2013. The information was verified by the guideline developer on May 7, 2013.

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